FAKULTÄT FÜR CHEMIE

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Einladung zum Vortrag von

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# "Interaction between plants and xenobiotics: Uptake and metabolization of non-steroidal anti-inflammatory drugs"

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Pharmaceuticals are widely used in both human and in veterinary medicine and prescriptions are increasing continuously. A negative side effect of this development is the fact that pharmaceutically active ingredients (AI´s) can be found in the aquatic system. This is due to either incomplete uptake by the human body (so still active substances are excreted), the washing off of drug containing gels and lotions during personal hygiene, and unfortunately still due to improper disposal of pharmaceuticals. Although contaminated municipal wastewater is treated in wastewater treatment plants (WTP), due to their stability many of these substances are unaffected by the treatment process currently used. As mainly in arid regions waters from such treatment plants are more and more used for irrigation in agriculture this may be problematic. Plants can come into direct contact with the AI´s, resulting in uptake or metabolization of the drug by the plant. Particularly in the case of edible plants the studying of such effects is particular concern.
In the present work we investigated the uptake of widely used pharmaceuticals in particular non-steroidal anti-inflammatory drugs (NSAIDs) and antidepressants by several edible plants namely cress (*Lepidium sativum),* onion *(Allium cepa),* lettuce *(Lactuca sativa),* pea *(Pisum sativum),* radish *(Raphanus sativus)*, and maize *(Zea mays).* A special focus was set on the transformation of the AI´s by the plant and the detection of the formed metabolites. After germination plants were cultivated in Petri dishes in the presence of drug containing water. After harvesting, plant parts were separated and extracted. Subsequently the extracts were analyzed by a RP-HPLC and high resolution mass spectrometry (QTOF and Orbitrap) was used for detection in order to identify potential metabolites. For most of the drugs studied, in addition to the parent drug, a series of metabolites could be detected including hydroxylation products as well as conjugates with glucose, glutamic acid, glutamine, phenylalanine and malonic acid. Based on the information from QTOF MS2 experiments, specific fragment ions were selected for each analyte for establishing a multiple reaction monitoring (MRM) method on a QqQ MS instrument. This allowed, in the case of the NSAID´s the analysis of plants treated with concentrations as low as 1 µg L-1. Additionally employing a semi-quantitative approach involving the use of a deuterated internal standard, the distribution of the parent drugs and the metabolites in different plant parts was investigated.

## Dienstag, 30. Jänner 2018, 15:00 Uhr
## Seminarraum 2
## Währinger Straße 42, 1090 Wien

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